

## THE TREATMENT OF ERYSIPELAS BY ROENTGEN RAY

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DISCUSSION by William J. Kerr, San Francisco; Albert Soiland, Los Angeles; Hiram E. Miller, San Francisco.

THE multiplicity of treatments advocated for erysipelas is the best evidence that we have had no specific form of therapy. Hippocrates advocated the use of cold water in the treatment of this disease. At the present time popular therapy, as stated by Doane, varies from the exhibition of Saint Anthony's bones to the application of cranberry poultices and the use of red flannel shirts.

Among the standard forms of treatment are: the local application of hot or cold compresses of a saturated solution of magnesium sulphate; various types of antiseptic solutions and ointments; mercuriochrome, gentian violet and other dyes intravenously; foreign blood injections; and antistreptococcic serum. For wandering erysipelas the collodion line, phenol line and other methods of compression have been used with varying success.

Despite treatment by these methods, erysipelas generally runs its course of from ten days to two weeks, treatment, in most cases, being of value only in relieving the patient symptomatically and having no influence on the lesion itself. The mortality varies from 4 to 7 per cent, being especially high in infants and almost universally fatal when the umbilical cord is involved.

Roentgen therapy for erysipelas has received very little attention in American literature except for occasional references in general articles. Hodges states that treatment by this method is valuable if only small areas are involved, and he reports good results in two cases. He advises against this form of therapy in severe, advanced lesions and in patients with an infected area more than 6 cm. in diameter.

Mackey, discussing Hodges' paper, reports the treatment of eleven patients, in ten of whom the temperature became normal in thirty hours without recurrence of fever. He concludes that the course of the disease is shortened by roentgen ray treatment.

There are several articles in the European litera-

ture in regard to this type of treatment. In 1917 Magalhaes was an unfortunate victim of erysipelas and followed the usual treatment, including serotherapy, without relief. Some time previous to the attack he had had occasion to treat a patient with carcinoma who also had erysipelas of the leg. The erysipelas was cured by the x-ray treatment. Magalhaes then decided to try this treatment upon himself and, after an exposure to the x-ray for fifteen minutes, he was able to walk with very little pain. The pain began to recur the next afternoon and he made another exposure, with complete relief. Subsequently he treated nine patients with about the same results as he had received. A gas tube and a low spark gap with a relatively long exposure was made over the affected areas and glands. In the same year (1917) Schmidt treated twenty-eight patients in seventeen of whom a drop in temperature by crisis followed one or two treatments. In four patients the drop in temperature was by lysis after two treatments; in three there were complications with extension to the mucous membrane, one with abscess. A marked retrogression of the skin condition occurred in twenty-five patients, in the other three the symptoms persisted. Daily treatments were given by rays filtered by 3 mm. aluminum.

In 1918 Hess treated fifty patients suffering with erysipelas of whom forty-three had fever. In twenty-two the temperature declined sharply in from one to two and one-half days after x-ray treatment; in six the temperature fell by lysis in two to three days; in nine there were complications, such as abscess and lobar pneumonia, and in six the erysipelas wandered to other areas. Daily treatments were given, aluminum filtered radiation being used.

In 1921 Schrader reported seven patients treated by roentgen therapy. Six yielded very promptly to treatment; one showed slight recurrence necessitating reirradiation; in five the temperature fell by crisis; in two by lysis. All yielded. He makes no statement of the technique used.

At the Woodland Clinic we have treated eleven patients with this form of therapy. In three only a small area was involved, while in the remaining moderate to large areas were infected. The temperature varied from 100 to 106; in four patients the temperature fell by crisis in twenty-four hours, while in six the temperature fell by lysis in from two to five days. In one patient the temperature dropped by crisis in twenty-four hours and remained normal for a day; then erysipelas occurred in a new area with high fever, which fell again by crisis within twenty-four hours, following another treatment. The symptoms disappeared within this time. In two patients there was an extension after the first treatment which promptly yielded after the second treatment. In every instance there was prompt relief from pain within twenty-four hours.

The average length of illness was five days and most patients received two treatments and none more than three treatments. Two patients had marked cervical adenitis which promptly responded to roentgen ray therapy. There were no other complications.

Our technique is very simple: the areas involved and a border of about 5 cm. are irradiated with

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unfiltered radiation at 100 Kv., 50 cm. distance and 35 Ma minutes over each area. This is approximately two-thirds of an epilating dose and one-half of an erythema dose. Irradiation is repeated in two days if regression has not been satisfactory. A third treatment was administered to one patient, using the same factors, with no complication more serious than a definite first degree erythema.

Our experience seems to indicate that the skin is much less sensitive to irradiation when there is a definite cellulitis present than it is in its normal condition. None of these patients has had skin changes after recovery which could in any way be attributed to irradiation.

Holtzknecht's theory is that irradiation increases the metabolic rate of the cells, thus assisting in the destruction of the bacteria, also that the rays produce changes in the organisms which precludes their further production of toxin. Whatever the explanation the sharp drop in temperature shows it to be consequential. Holtzknecht's theory appeals to us as being the most logical of those advanced.

#### CONCLUSIONS

1. Roentgen therapy for erysipelas is a valuable form of treatment.
2. Relief is obtained generally within twenty-four hours.
3. The febrile period is shorter than in infections of equal severity treated by other measures and the usual length of illness is shortened.
4. There are, possibly, fewer complications and less chance of spread than in other forms of treatment.
5. There is no pain or discomfort attending the treatment.
6. Advanced, serious cases of erysipelas, involving fairly large areas, with high temperature and general infection may be treated successfully.

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#### DISCUSSION

WILLIAM J. KERR, M.D. (University of California Medical School, San Francisco)—The authors present a series of cases on the treatment of erysipelas with roentgen ray which should be of interest to all clinicians. We are all familiar with the variability of erysipelas in its clinical features; its tendency to end by crisis in a considerable number of cases in a definite period of time. It makes it, therefore, somewhat difficult to interpret the value of any special therapeutic measure under such conditions, unless we have a sufficiently large series of cases with adequate controls. The authors do not give sufficient clinical data to prove that the x-ray treatment materially shortened the course of the disease, although the average

duration of fever and the eruptions on the face were apparently shorter than ordinarily seen.

The question as to the possible effect of the roentgen ray upon the process has been discussed, and it would seem to me the most likely benefit that could be expected would probably come from a stimulation of the reticulo-endothelial system in the areas adjacent to the eruption. It has been shown definitely by experimental work that the organisms precede the indurated border as it advances in the tissues, and the roentgen ray may so stimulate the reticulo-endothelial system that the processes of immunity may be stimulated locally. The authors have not given adequate consideration to the recent experimental and clinical studies on the organisms responsible for erysipelas. It has been pretty definitely shown, I think, that a group of hemolytic streptococci are responsible for the disease, and when the soluble toxin is injected into the horse it will stimulate the production of an immune serum. An immune serum has been developed which causes local blanching upon injection into the erysipelas lesion and, when given intravenously in sufficiently large doses, apparently controls and limits the course of the disease. This would place erysipelas in about the same category as scarlet fever.

It is possible that roentgen ray therapy may be used as an adjunct to the serum therapy for erysipelas, but I do not feel it would entirely replace it in general use. Of course, one must keep in mind the precautions necessary and the dangers in the use of serum therapy.

ALBERT SOILAND, M.D. (1407 South Hope Street, Los Angeles)—The paper by Harbinson and Lawson stands out notably because of the brief and straightforward manner in which the subject is presented and the common-sense deductions from the authors' observation of the work. Among radiologists it is generally known that radiation in the proper wave form is suitable for surface lesions with or without infection. Nearly every radiologist who has had experience with radiation therapy has been struck by the rapid response to surface radiation of infectious processes either of the skin or mucous membrane.

It is rare for any individual to have the opportunity to treat this disease in numbers. We have, however, in our service had sufficient experience with erysipelas to support the authors' remarks.

With our modern knowledge of the biological effect of radiation there is ample ground for its use in the class of cases presented by the authors.

HIRAM E. MILLER, M.D. (384 Post Street, San Francisco)—Any therapeutic aid in the treatment of so serious and so frequently fatal a disease as erysipelas is most welcome. I personally have never treated erysipelas with the roentgen ray, and I do not think that the reports in the literature have been particularly convincing. From my experience in treating other acute infections of the skin with the roentgen ray I cannot feel that it has a very definite place in the treatment of erysipelas if the dosage as used by the authors is necessary. They state that most patients received two treatments of one-half an erythema dose each—that is to say a full erythema dose. I personally would feel that a skin traumatized by an erythema dose of roentgen ray would be an excellent field for a few lingering streptococci to start a recurrent and most virulent attack of erysipelas. I wonder if the same therapeutic effect could not be produced by two treatments of, say, one-eighth to one-fourth of an erythema dose.

AUTHORS (closing)—Since writing this paper Birkhaug has published his work on the treatment of sixty cases of erysipelas with specific antiserum. It would be interesting to compare the results of this form of therapy with roentgen ray therapy in an equal number of patients with erysipelas of about the same severity. We believe, if roentgen ray therapy proves to be as efficacious as treatment by specific antiserum, the former should be the treatment of choice, principally on account of the danger attending the administration of any type of antitoxin.

We realize that only a small series of cases have been reported in this paper, but the results have been very encouraging. Perhaps the report of these cases may stimu-

late others to report their results with roentgen ray treatment of erysipelas, thus giving more data so that reliable conclusions may be drawn. Most physicians have had very limited, if any, experience in treating erysipelas by roentgen ray. We are very glad to have the encouraging support of Doctor Soiland and, until we are convinced by further reports that erysipelas antistreptococci serum is definitely a better form of treatment for erysipelas, we shall continue to treat our patients by roentgen ray therapy.

The literature on this subject is quite meager, as already pointed out, and found only in the European journals. Consequently we cannot expect a preponderant mass of evidence in favor of the treatment.

One of the authors (Doctor Lawson) has recently published an article dealing with pyogenic skin lesions and their treatment by roentgen ray. He has observed that skin which is the site of an active infection will withstand from two to three erythema doses without showing any evidence of roentgen trauma. This observation has been substantiated by many roentgenologists who have treated these cases. In our experience we have not found very small doses, that is one-eighth to one-fourth of an erythema dose, to be efficacious.

## CONGENITAL ATRESIA OF THE DUODENUM

WITH REPORT OF A CASE

By C. VERNER THOMPSON \*

THE report of such a case as this is justified only because of the rarity of the condition. According to Tyces' system the first case was reported in 1803. Since then something over one hundred have appeared in the literature, and according to Abt there have been but three cases that have survived. These three were necessarily treated surgically.

The underlying cause for the appearance of an atresia in any portion of the intestinal tract is many times obscure. Several theories have been advanced that will account for one or a few of the lesions reported, but there is no theory that will adequately explain all atresic lesions.

One theory is that in the course of fetal development there occurs a desquamation of cells into what becomes the lumen of the gut. Canalization or an absorption of these desquamated cells then occurs as the fetal life progresses. One author has stated that the presence of the atresia may become defined as early as the fourth week of fetal life. With this idea of the absorption of an epithelial plug in the intestinal tract in mind the reason of the three types of atresias that occur becomes clear. The atresia may be (1) complete, (2) partial, and (3) in the form of a diaphragm as when all but a thin portion of the plug is absorbed.

The duodenum seems to have a certain predilection for the formation of atresias because in the few inches almost half as many occur as in the many remaining feet of gut. The involved area is more frequent in the region of the ampulla of Vater and usually just above the ampulla. The presence of one such anomaly is frequently associated with some other type of deformity; imperforate urethra, spina bifida, imperforate anus, bifurcation of the esophagus or multiple atresias in the intestinal tract else-

where being a few of the other anomalies. The mesentery or mesocolon may be partially absent or otherwise deformed. Peritonitis may be present and is usually considered of syphilitic origin.

The babies in certain instances are premature, but as a rule they are fully developed and to all appearances when delivered are perfectly normal; they are often the first born.

In general the symptoms of duodenal atresias are rather constant depending somewhat on the exact site of the obstruction and are characteristic of obstruction.

Vomiting is always present, appears immediately with the ingestion of fluid or food, starts in easily, rapidly becomes projectile, and may come immediately with the taking of food or may follow in a few minutes to half an hour or more.

Constipation is present and becomes decidedly noticeable after thirty-six, forty-eight hours or more. The movements from the meconium present may mask the fact for a number of hours that the little patient is passing nothing through the bowel.

Distention becomes marked in a short time and, of course, is more pronounced just after the taking of fluids and just before it is vomited. With the obstruction in the duodenum the distention is marked in the upper abdomen giving the belly a funnel-shaped appearance.

Peristaltic waves can always be distinguished above the obstruction if care is used in looking for them.

Anuria, because of the small absorption of fluids, soon becomes apparent. Jaundice may or may not be present and probably will not help in making the diagnosis.

Emaciation is usually rapid, especially after the first twenty-four or thirty-six hours.

Restlessness may or may not be of diagnostic help early in the life of the infant. With the dehydration that follows the inability to absorb fluids the babies frequently become restless and their cry soon begins to lose its vigor.

Differential diagnosis must take into consideration hypertrophic pyloric stenosis, cerebral hemorrhage, and acquired obstruction such as an intussusception. The diagnosis should be determined early. Hypertrophic stenosis must be ruled out. This can as a rule be done by the frequent presence of a palpable mass in the upper abdomen, and the onset of the symptoms in a case of pyloric stenosis is not always of the abruptness that is found in atresia. The hypertrophic pyloric type of obstruction as a rule allows small amounts of food to pass by and appear in the stool. The symptoms therefore do not become so pronounced until several days, weeks, or even months have elapsed.

Cerebral hemorrhage can be ruled out by the early appearance of food products in the stools and the absence of distension.

An acquired obstruction such as may come from a volvulus or from bands cannot be differentiated from an atresia if it is present at birth or if it appears very soon after birth.

The prognosis as has been indicated is very grave. Operative procedure is justified at the earliest possible moment after the diagnosis has been deter-

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